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5 **SEQUENCE LISTING**

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SOURCE:

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REFERENCE:

Hepatitis C virus replicon I377/NS3-3'UTR artificial sequence; vectors.

Hepatitis C virus replicon I377/NS3-3'UTR.

1 (bases 1 to 7989)

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AUTHORS:
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                                                                                         Lohmann, V.,
                                                                                                                                        Korner, F.,
                                                                                                                                                                               Koch, J.,
                                                                                                                                                                                                                Herian, U.,
                                                                                                                                                                                                                                                        Theilmann,L.
                                                                                                                                                                                                                                                                                                       and
                           Bartenschlager, R.
                          TITLE:
                                                                                         Replication of subgenomic hepatitis C virus RNAs in a hepatoma cell line
                           JOURNAL:
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                           MEDLINE
                                                                                         99322193
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                                                                                         2 (bases 1 to 7989)
                          AUTHORS:
                                                                                         Bartenschlager, R.
                          TITLE:
                                                                                         Direct Submission
                          JOURNAL:
                                                                                         Submitted (26-MAY-1999) Bartenschlager R., Institute for Virology,
                          Johannes Gutenberg - University Mainz, Obere Zahlbacher Strasse 67, 55131 Mainz, GERMANY
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7759..7989

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SEQ ID NO: 2

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ļ. <u>.</u>		7381 catggcetta gegeatttte actecatagt tacteteeag gtgagateaa tagggtgget
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¥Į,	20	7561 aactgggcag taaggaccaa gctcaaactc actccaatcc cggctgcgtc ccagttggat
(N		7621 ttatccagct ggttcgttgc tggttacagc gggggagaca tatatcacag cctgtctcgt
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- -		7741 ctactcccca accgatgaac ggggagctaa acactccagg ccaataggcc atcctgtttt
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30 3. HCV Replicon RNA from cell line HCVR8SEQ ID NO: 3

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5584 cccatatggg cacgecegga ttacaaccet ccactgttag agteetggaa ggaceeggae 5644 tacgtccctc cagtggtaca cgggtgtcca ttgccgcctg ccaaggcccc tccgatacca 5704 cctccacgga ggaagaggac ggttgtcctg tcagaatcta ccgtgtcttc tgccttggcg 5764 gagetegeca caaagacett eggeagetee gaategtegg eegtegacag eggeaeggea 5824 acggcetete etgaceagee etcegacgae ggcgacgegg gateegaegt tgagtegtae 5884 teetecatge ecceettga gggggageeg ggggateeeg ateteagega egggtettgg 5944 totaccgtaa gogaggaggo tagtgaggac gtogtotgot gotogatgto otacacatgg 6004 acaggegeee tgateaegee atgegetgeg gaggaaacea agetgeeeat caatgeaetg 6064 ageaactett tgeteegtea ceacaacttg gtetatgeta caacateteg cagegeaage 6124 etgeggeaga agaaggteae etttgacaga etgeaggtee tggaegaeea etaeegggae 6184 gtgctcaagg agatgaaggc gaaggcgtcc acagttaagg ctaaacttct atccgtggag 6244 gaageetgta agetgaegee eccacatteg geeagateta aatttggeta tggggeaaag 6304 gacgtccgga acctatccag caaggccgtt aaccacatcc gctccgtgtg gaaggacttg 6364 ctggaagaca ctgagacacc aattgacacc accatcatgg caaaaaatga ggttttctgc 6424 gtccaaccag agaagggggg ccgcaagcca gctcgcctta tcgtattccc agatttgggg 6484 gttcgtgtgt gcgagaaaat ggccctttac gatgtggtct ccaccctccc tcaggccgtg 6544 atgggetett cataeggatt ceaataetet eetggacage gggtegagtt eetggtgaat 6604 gcctggaaag cgaagaaatg ccctatgggc ttcgcatatg acacccgctg ttttgactca 6664 acggtcactg agaatgacat ccgtgttgag gagtcaatct accaatgttg tgacttggcc 6724 cccgaageca gacaggecat aaggtegete acagagegge tttacategg gggececetg 6784 actaatteta aagggeagaa etgeggetat egeeggtgee gegegagegg tgtaetgaeg 6844 accagetgeg gtaataccet caeatgttae ttgaaggeeg etgeggeetg tegagetgeg 6904 aageteeagg actgeacgat getegtatge ggagaegaee ttgtegttat etgtgaaage 6964 geggggaece aagaggaega ggegageeta egggeettea eggaggetat gaetagatae 7024 tetgeecece etggggaece geceaaacea gaataegaet tggagttgat aacateatge 7084 tectecaatg tgteagtege geaegatgea tetggeaaaa gggtgtaeta teteaceegt 7144 gaccccacca ecceettge gegggetgeg tgggagacag etagacacae tecagteaat 7204 teetggetag geaacateat eatgtatgeg eccacettgt gggeaaggat gateetgatg 7264 acteattet tetecateet tetageteag gaacaaettg aaaaageeet agattgteag 7324 atctacgggg cctgttactc cattgagcca cttgacctac ctcagatcat tcaacgactc

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5	7384 catggcetta gegeatttte actecatagt tactetecag gtgagateaa tagggtgget
	7444 teatgeetea ggaaacttgg ggtacegeee ttgegagtet ggagacateg ggeeagaagt
	7504 gtccgcgcta ggctactgtc ccaggggggg agggctgcca cttgtggcaa gtacctcttc
	7564 aactgggcag taaggaccaa geteaaacte acteeaatee eggetgegte eeagttggat
	7624 ttatccaget ggttcgttgc tggttacage gggggagaca tatatcacag cetgtctcgt
10	7684 gecegaceee getggtteat gtggtgeeta eteetaettt etgtaggggt aggeatetat
	7744 ctacteccea accgatgaac ggggagetaa acaetecagg ceaataggee atcetgtttt
	7804 ttteeetttt tttttttttt ttttttttt ttttttt
	7864 ttttteetet tttttteett ttettteett tggtggetee atettageee tagteaegge
	7924 tagetgtgaa aggteegtga geegettgae tgeagagagt getgataetg geetetetge
15	7984 agatcaagta ct

4. HCV Replicon RNA from cell line HCVR9 SEQ ID NO: 4

1 gecagecee gattgggge gacactecae catagateae teceetgtga ggaactactg
61 tetteaegea gaaagegtet agecatggeg ttagtatgag tgtegtgeag ceteeaggae
121 eeeeeetee gggagageea tagtggtetg eggaaeeggt gagtacaeeg gaattgeeag
181 gacgaeeggg teetttettg gateaaeeeg eteaatgeet ggagatttgg gegtgeeeee
241 gegagaetge tageegagta gtgttgggte gegaaaggee ttgtggtaet geetgatagg
301 gtgettgega gtgeeeeggg aggtetegta gaeegtgeae eatgageaeg aateetaaae
361 eteaaagaaa aaceaaaggg egegeeatga ttgaacaaga tggattgeae geaggttete
421 eggeegettg ggtggagagg etattegget atgaetggge acaacagaea ateggetget
481 etgatgeege egtgtteegg etgteagege aggggegeee ggttettttt gteaagaeeg
541 acetgteegg tgeeetgaat gaaetgeagg aegaggeage geggetateg tggetggeea
601 egaegggegt teettgegea getgtgeteg aegttgteae tgaageggaa agggaetgge
661 tgetattggg egaagtgeeg gggeaggate teetgteate teacettget eetgeeggaa
721 aagtateeat eatggetgat geaatgegge ggetgeatae gettgateeg getaeetgee
781 eattegaeea eeaagegaaa eategeateg agegageaeg taeteggatg gaageeggte
841 ttgtegatea ggatgatetg gaegaagage ateagggget egegeeagee gaaetgtteg

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901 ccaggctcaa ggcgcgcatg cccgacggcg aggatctcgt cgtgacccat ggcgatgcct 961 gettgeegaa tateatggtg gaaaatggee gettttetgg atteategae tgtggeegge 1021 tgggtgtggc ggaccgctat caggacatag cgttggctac ccgtgatatt gctgaagagc 1081 ttggcggcga atgggctgac cgcttcctcg tgctttacgg tatcgccgct cccgattcgc 1141 agegeatege ettetatege ettettgaeg agttettetg agtttaaaca gaecacaaeg 1201 gtttccctct agegggatca attccgccc tetecetece eccecetaa egttaetgge 1261 cgaagccgct tggaataagg ccggtgtgcg tttgtctata tgttattttc caccatattg 1321 cogtettttg geaatgtgag ggeeeggaaa eetggeeetg tettettgae gageatteet 1381 aggggtettt eccetetege caaaggaatg caaggtetgt tgaatgtegt gaaggaagea 1441 gtteetetgg aagettettg aagacaaaca aegtetgtag egaceetttg eaggeagegg 1501 aacccccac ctggcgacag gtgcctctgc ggccaaaagc cacgtgtata agatacacct 1561 gcaaaggcgg cacaacccca gtgccacgtt gtgagttgga tagttgtgga aagagtcaaa 1621 tggctctcct caagcgtatt caacaagggg ctgaaggatg cccagaaggt accccattgt 1681 atgggatetg atetggggee teggtgeaea tgetttaeat gtgtttagte gaggttaaaa 1741 aacgtctagg cccccgaac cacggggacg tggttttcct ttgaaaaaca cgataatacc 1801 atggcgccta ttacggccta ctcccaacag acgcgaggcc tacttggctg catcatcact 1861 agecteaeag geegggaeag gaaceaggte gagggggagg teea \underline{G} gtggt eteeaeegea 1921 acacaatett teetggegae etgegteaat ggegtgtgtt ggaetgteta teatggtgee 1981 ggctcaaaga ccettgccgg cccaaagggc ccaatcaccc aaatgtacac caatgtggac 2041 caggaceteg teggetggea agegeeece ggggegegtt cettgacace atgeacetge 2101 ggcagctcgg acctttactt ggtcacgagg catgccgatg tcattccggt gcgccggcgg 2161 ggcgacagca gggggagcct actetecece aggecegtet cetaettgaa gggetetteg 2221 ggcggtccac tgctctgccc ctcggggcac gctgtgggca tctttcgggc tgccgtgtgc 2281 acccgagggg ttgcgaaggc ggtggacttt gtacccgtcg agtctatgga aaccactatg 2341 eggteeegg tetteaegga caactegtee eeteeggeeg taeegeagae atteeaggtg 2401 geceatetae aegeeectae tggtagegge aagageaeta aggtgeegge tgegtatgea 2461 geccaagggt ataaggtget tgteetgaae eegteegteg eegecaeeet aggttteggg 2521 gcgtatatgt ctaaggcaca tggtatcgac cctaacatca gaaccggggt aaggaccatc 2581 accaegggtg eccecateae gtaeteeace tatggeaagt ttettgeega eggtggttge 2641 tetgggggeg cetatgacat cataatatgt gatgagtgee acteaactga etegaceact

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2701 atcctgggca tcggcacagt cctggaccaa gcggagacgg ctggagcgcg actcgtcgtg 2761 ctcgccaccg ctacgcctcc gggatcggtc accgtgccac atccaaacat cgaggaggtg 2821 getetgteea geaetggaga aateceettt tatggeaaag ceateceeat egagaceate 2881 aagggggga ggcacctcat tttctgccat tccaagaaga aatgtgatga gctcgccgcg 2941 aagetgteeg geeteggaet eaatgetgta geatattace ggggeettga tgtateegte 3001 ataccaacta geggagaegt cattgtegta geaaeggaeg etetaatgae gggetttaee 3061 ggcgatttcg actcagtgat cgactgcaat acatgtgtca cccagacagt cgacttcagc 3121 etggaceega cetteaceat tgagacgaeg acegtgeeae aagaegeggt gteaegeteg 3181 cagcggcgag gcaggactgg taggggcagg atgggcattt acaggtttgt gactccagga 3241 gaacggccct cgggcatgtt cgattcctcg gttctgtgcg agtgctatga cgcgggctgt 3301 gettggtaeg ageteaegee egeegagaee teagttaggt tgegggetta eetaaaeaea 3361 ccagggttgc ccgtctgcca ggaccatctg gagttctggg agagcgtctt tacaggcctc 3421 acceacatag acgeceattt ettgteecag actaageagg eaggagaeaa etteecetae 3481 etggtageat accaggetae ggtgtgegee agggeteagg etceaectee ategtgggae 3541 caaatgtgga agtgteteat aeggetaaag eetaegetge aegggeeaae geeeetgetg 3601 tataggetgg gageegttea aaaegaggtt actaecaeae acceeataae eaaataeate 3661 atggcatgca tgtcggctga cctggaggtc gtcacgagca cctgggtgct ggtaggcgga 3721 gtcctagcag ctctggccgc gtattgcctg acaacaggca gcgtggtcat tgtgggcagg 3781 atcatettgt ceggaa G gcc gcc atcatt cegacaggg aagteettta cegggagtte3841 gatgagatgg aagagtgege etcacacete cettacateg aacagggaat geagetegee 3901 gaacaattca aacagaaggc aatcgggttg ctgcaaacag ccaccaagca agcggaggct 3961 getgeteeeg tggtggaate caagtggegg accetegaag cettetggge gaagcatatg 4021 tggaatttca tcagcgggat acaatattta gcaggcttgt ccactctgcc tggcaacccc 4081 gegatageat eactgatgge atteacagee tetateacea gecegeteae eacceaacat 4141 accetectgt ttaacatect ggggggatgg gtggccgccc aacttgctcc teccageget 4201 gettetgett tegtaggege eggeateget ggageggetg ttggeageat aggeettggg 4261 aaggtgettg tggatatttt ggeaggttat ggageagggg tggeaggege getegtggee 4321 tttaaggtca tgagcggcga gatgccctcc accgaggacc tggCtaacct actccctgct 4381 atectetece etggegeeet agtegteggg gtegtgtgeg eagegataet gegteggeae 4441 gtgggcccag gggaggggc tgtgcagtgg atgaaccggc tgatagcgtt cgcttcgcgg

4301 Eguaceaeg teleecedae geactatege cotgagageg aegetgeage aegigteaet
4561 cagatectet etagtettae eateaeteag etgetgaaga ggetteaeea gtggateaae
4621 gaggactgct ccacgccatg ctccggctcg tggctaagag atgtttggga ttggatatgc
4681 acggtgttga ctgatttcaa gacctggctc cagtccaagc tcctgccgcg attgccggga
4741 gtccccttct tctcatgtca acgtgggtac aagggagtct ggcggggcga cggcatcatg
4801 caaaccacct geceatgtgg ageacagate accggacatg tgaaaaa $\underline{\mathbf{A}}$ gg ttecatgagg
4861 atcgtggggc ctaggacctg tagtaacacg tggcatggaa cattccccat taacgcgtac
4921 accaegggee eetgeaegee eteeeeggeg ecaaattatt etagggeget gtggegggtg
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5041 accactgaca acgtaaagtg cccgtgtcag gttccggccc ccgaattctt cacagaagtg
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5581 cccatatggg cacgcccgga ttacaaccct ccactgttag agtcctggaa ggacccggac
5641 taegteete eagtggtaca egggtgteea ttgeegeetg eeaaggeece teegatacea
5701 cetecaegga ggaagaggae ggttgteetg teagaateta eegtgtette tgeettggeg
5761 gagetegeca caaagacett eggeagetee gaategtegg eegtegacag eggeaeggea
5821 aeggeetete etgaceagee eteegaegae ggegaegegg gateegaegt tgagtegtae
5881 teeteeatge eeeeettga gggggageeg ggggateeeg ateteagega egggtettgg
5941 tetacegtaa gegaggagge tagtgaggae gtegtetget getegatgte etacacatgg
6001 acaggegeee tgateaegee atgegetgeg gaggaaacea agetgeeeat caatgeaetg
6061 ageaactett tgeteegtea ceacaacttg gtetatgeta caacateteg eagegeaage
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6181 gtgeteaagg agatgaagge gaaggegtee acagttaagg etaaacttet ateegtggag
6241 gaagectota agetgaegee eccacatteg gecagateta aatttggeta tggggeaaag

5 6301 gacgtccgga acctatccag caaggccgtt aaccacatcc gctccgtgtg gaaggacttg 6361 ctggaagaca ctgagacacc aattgacacc accatcatgg caaaaaatga ggttttctgc 6421 gtccaaccag agaagggggg ccgcaagcca gctcgcctta tcgtattccc agatttgggg 6481 gttegtgtgt gegagaaaat ggeeetttae gatgtggtet eeaeeeteee teaggeegtg 6541 atgggetett cataeggatt ceaataetet eetggacage gggtegagtt eetggtgaat 10 6601 gcctggaaag cgaagaaatg ccctatgggc ttcgcatatg acacccgctg ttttgactca 6661 acggtcactg agaatgacat ccgtgttgag gagtcaatct accaatgttg tgacttggcc 6721 cccgaagcca gacaggccat aaggtegete acagagegge tttacategg gggeceetg 6781 actaatteta aagggeagaa etgeggetat egeeggtgee gegegagegg tgtaetgaeg 6841 accagetgeg gtaataccet cacatgttae ttgaaggeeg etgeggeetg tegagetgeg 15 6901 aageteeagg aetgeaegat getegtatge ggagaegaee ttgtegttat etgtgaaage 6961 geggggaeee aagaggaega ggegageeta egggeettea eggaggetat gaetagatae 7021 tetgecece etggggacee geceaaacea gaataegaet tggagttgat aacateatge 7081 tectecaatg tgteagtege geaegatgea tetggeaaaa gggtgtaeta teteaceegt 7141 gaccccacca cocccttge gegggetgeg tgggagacag etagacacac tecagteaat 7201 teetggetag geaacateat eatgtatgeg eccacettgt gggeaaggat gateetgatg 7261 actcatttct tetecatect tetageteag gaacaacttg aaaaageeet agattgteag 7321 atctacgggg cctgttactc cattgagcca cttgacctac ctcagatcat tcaacgactc 7381 catggcctta gcgcattttc actccatagt tactctccag gtgagatcaa tagggtggct 7441 teatgeetea ggaaacttgg ggtacegeee ttgegagtet ggagacateg ggeeagaagt 7501 gtccgcgcta ggctactgtc ccaggggggg agggctgcca cttgtggcaa gtacctcttc 7561 aactgggcag taaggaccaa gctcaaactc actccaatcc cggctgcgtc ccagttggat 7621 ttatccaget ggttcgttgc tggttacage gggggagaca tatatcacag cetgtctcgt 7681 georgaecce getggtteat gtggtgeeta etectaettt etgtaggggt aggeatetat 7741 ctacteccea acegatgaae ggggagetaa acaetecagg ceaataggee atectgtttt 30 7861 tttttcctct ttttttcctt ttctttcctt tggtggctcc atcttagccc tagtcacggc 7921 tagetgtgaa aggteegtga geegettgae tgeagagagt getgataetg geetetetge 7981 agatcaagta ct

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5. HCV Replicon from cell line HCVR22

SEQ ID NO: 5

1 gecageceee gattggggge gacacteeae catagateae teecetgtga ggaactaetg 61 tetteaegea gaaagegtet agecatggeg ttagtatgag tgtegtgeag ceteeaggae 121 ccccctccc gggagagcca tagtggtctg cggaaccggt gagtacaccg gaattgccag 181 gacgaccggg teetttettg gateaacccg eteaatgeet ggagatttgg gegtgeecce 241 gcgagactgc tagccgagta gtgttgggtc gcgaaaggcc ttgtggtact gcctgatagg 301 gtgcttgcga gtgccccggg aggtctcgta gaccgtgcac catgagcacg aatcctaaac 361 ctcaaagaaa aaccaaaggg cgcgccatga ttgaacaaga tggattgcac gcaggttctc 421 eggeegettg ggtggagagg etattegget atgaetggge acaacagaca ateggetget 481 ctgatgccgc cgtgttccgg ctgtcagcgc aggggcgccc ggttcttttt gtcaagaccg 541 acctgtccgg tgccctgaat gaactgcagg acgaggcagc gcggctatcg tggctggcca 601 cgacgggcgt tccttgcgca gctgtgctcg acgttgtcac tgaagcggga agggactggc 661 tgctattggg cgaagtgccg gggcaggatc tcctgtcatc tcaccttgct cctgccgaga 721 aagtateeat eatggetgat geaatgegge ggetgeatae gettgateeg getaeetgee 781 cattegacea ceaagegaaa categeateg agegageaeg tacteggatg gaageeggte 841 ttgtcgatca ggatgatctg gacgaagagc atcagggget cgcgccagcc gaactgttcg 901 ccaggetcaa ggegegeatg cccgaeggeg aggatetegt egtgaeceat ggegatgeet 961 gettgeegaa tateatggtg gaaaatggee gettttetgg atteategae tgtggeegge 1021 tgggtgtggc ggaccgctat caggacatag cgttggctac ccgtgatatt gctgaagagc 1081 ttggcggcga atgggctgac cgcttcctcg tgctttacgg tatcgccgct cccgattcgc 1141 agegeatege ettetatege ettettgaeg agttettetg agtttaaaca gaccacaaeg 1201 gtttccctct agegggatca attccgcccc tctccctccc cccccctaa cgttactggc 1261 cgaagccgct tggaataagg ccggtgtgcg tttgtctata tgttattttc caccatattg 1321 ccgtcttttg gcaatgtgag ggcccggaaa cctggccctg tcttcttgac gagcattcct 1381 aggggtettt eccetetege caaaggaatg caaggtetgt tgaatgtegt gaaggaagea 1441 gttcctctgg aagcttcttg aagacaaaca acgtctgtag cgaccctttg caggcagcgg 1501 aacccccac ctggcgacag gtgcctctgc ggccaaaagc cacgtgtata agatacacct 1561 gcaaaggegg cacaacccca gtgccacgtt gtgagttgga tagttgtgga aagagtcaaa

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1621 tggctctcct caagcgtatt caacaagggg ctgaaggatg cccagaaggt accccattgt 1681 atgggatetg atetggggee teggtgeaea tgetttaeat gtgtttagte gaggttaaaa 1741 aacgtetagg cccccgaa $\underline{\mathbf{T}}$ cacggggacg tggttttcct ttgaaaaaca cgataatacc 1801 atggcgccta ttacggccta ctcccaacag acgcgaggcc tacttggctg catcatcact 1861 agecteacag geegggacag gaaceaggte gagggggagg tecaagtggt etceacegea 1921 acacaatett teetggegae etgegteaat ggegtgtgtt ggaetgteta teatggtgee 1981 ggetcaaaga eeettgeegg eecaaaggge eeaatcacee aaatgtacae eaatgtggae 2041 caggaceteg teggetggea agegeeece ggggegegtt cettgacace atgeacetge 2101 ggcagetegg acctttactt ggtcaegagg catgeegatg teatteeggt gegeeggegg 2161 ggcgacagca gggggagcct actetecece aggecegtet ectaettgaa gggetetteg 2221 ggeggteeae tgetetgeee eteggggeae getgtgggea tettteggge tgeegtgtge 2281 acccgagggg ttgcgaaggc ggtggacttt gtacccgtcg agtctatggG aaccactatg 2341 eggteecegg tetteaegga caactegtee ceteeggeeg tacegeagae atteeaggtg 2401 geceatetae aegeeectae tggtagegge aagageaeta aggtgeegge tgegtatgea 2461 gcccaagggt ataaggtget tgtcctgaac ccgtccgtcg ccgccaccct aggtttcggg 2521 gegtatatgt etaaggeaca tggtategae eetaacatea gaaceggggt aaggaecate 2581 accaegggtg eccecateae gtaeteeace tatggeaagt ttettgeega eggtggttge 2641 tetgggggeg cetatgaeat cataatatgt gatgagtgee aeteaactga etegaeeact 2701 atectgggea teggeacagt cetggaceaa geggagaegg etggagegeg aetegtegtg 2761 ctcgccaccg ctacgcctcc gggatcggtc accgtgccac atccaaacat cgaggaggtg 2821 getetgteea geaetggaga aateceettt tatggeaaag ceateceeat egagaceate 2881 aaggggggga ggcacctcat tttctgccat tccaagaaga aatgtgatga gctcgccgcg 2941 aagetgteeg geeteggaet eaatgetgta geatattace ggggeettga tgtateegte 3001 ataccaacta geggagaegt cattgtegta geaaeggaeg etetaatgae gggetttace 3061 ggcgatttcg actcagtgat cgactgcaat acatgtgtca cccagacagt cgacttcagc 30 3121 ctggacccga cetteaceat tgagacgacg accgtgecae aagacgeggt gteacgeteg 3181 cagcggcgag gcaggactgg taggggcagg atgggcattt acaggtttgt gactccagga 3241 gaacggccct cgggcatgtt cgattcctcg gttctgtgcg agtgctatga cgcgggctgt 3301 gettggtacg ageteaegee egeegagace teagttaggt tgegggetta eetaaacaca 3361 ccagggttgc ccgtctgcca ggaccatctg gagttctggg agagcgtctt tacaggcctc

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